

**Before the
Federal Communications Commission
Washington, D.C. 20554/**

In the Matter of)	
)	
Amendment of the Commission's)	ET Docket No. 95-183
Rules Regarding the 37.0-38.6 GHz and)	RM-8553
38.6-40.0 GHz Bands)	
)	
Implementation of Section 309(j) of the)	PP Docket No. 93-253
Communications Act -- Competitive)	
Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz)	
Bands)	

**COMMENTS OF
FIRST AVENUE NETWORKS, INC.**

First Avenue Networks, Inc. (“FAN”) herewith submits its comments on the Third Notice of Proposed Rulemaking (“*Notice*”) in the above-captioned rulemaking proceeding.¹ The *Notice* proposes the allocation and licensing of spectrum in the 37.0-38.6 and 42.0-42.5 GHz bands (“37/42 GHz bands”) for use similar to—and under rules comparable to—the existing terrestrial fixed allocation at 38.6-40.0 GHz (“39 GHz band”). As discussed herein and in the attached Declaration of Dr. Simon Wilkie, former Chief Economist of the FCC,² the public interest would not be served by the licensing of the 37/42 GHz at this time. Accordingly, FAN recommends that the FCC defer indefinitely consideration of further licensing in the millimeter wave bands.

¹ Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, ET Docket No. 95-183, RM-8553; Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz Bands, PP Docket No. 93-253 (rel. May 5, 2004) (“*Notice*”); *see also* Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, *Notice of Proposed Rule Making and Order*, 11 FCC Rcd 4930 (1995) (“*First NPRM and Order*”), *Report and Order and Second Notice of Proposed Rule Making*, ET Docket No. 95-183, 12 FCC Rcd 18,600 (1997) (“*R&O and Second NPRM*”), on reconsideration, *Memorandum Opinion and Order*, 14 FCC Rcd 12,428 (1999) (“*MO&O*”).

² See Declaration of Simon Wilkie, appended as Attachment 1 (“*Dr. Wilkie Declaration*”).

I. BACKGROUND

FAN holds what it believes is the premier inventory of millimeter wave authorizations in the country. FAN is the successor-in-bankruptcy to Advanced Radio Telecom, Inc. (“ART”), which held a nationwide footprint of 39 GHz spectrum. More recently, FAN and Teligent, the nation’s most significant 24 GHz spectrum holder, concluded an agreement whereby Teligent’s radio assets will be assigned to FAN, pending FCC and other regulatory approvals. FAN also participated in the Commission’s recent 24 GHz spectrum auction, and was the high bidder for a 24 GHz authorization in the Denver, Colorado market.

FAN’s business plan is based on leasing, under the FCC’s secondary markets policies, broadband point-to-point and point-to-multipoint spectrum capacity to carriers and large end users. Indeed, FAN currently offers an “ExpressLink” product that makes available OC-3 capacity on a leased basis starting at a mere \$500.00 per year. This product is targeted at carriers requiring high bandwidth transmission capacity to serve, for example, as backhaul or to reach customers that are off-fiber. To date, and notwithstanding aggressive marketing, FAN has concluded only 25 ExpressLink leases. Spectrum leasing, however, is a nascent field and FAN believes it is well-positioned for near term growth.

FAN, like many other millimeter wave carriers, originally started as a more vertically integrated carrier. In its incarnation as ART, the company built out point-to-point rings and sought out customers based on the offering of transmission services. This same model, or a similar model, was also employed by Teligent, XO, CommCo, and WinStar. As the bankruptcies of all of these companies illustrates, however, the carrier model is untenable at the present time. Each of these companies, to

the extent they exist post-bankruptcy, has based their new business plans on the leasing model.

As previously noted, FAN is exceedingly hopeful regarding its future business prospects. The cost of millimeter wave equipment has come down significantly since the industry implosion of a few years ago, and demand from 3G and broader bandwidth applications appears to be on the horizon. With its portfolio of 39 GHz and 24 GHz spectrum, which offers near nationwide coverage, significant depth in major markets, and physical propagation alternatives, FAN believes it is well-positioned to address a substantial niche market in broadband.

II. ARGUMENT

FAN does not believe that it is in the public interest to allocate and license additional millimeter wave spectrum at this time. As discussed below and in the declaration of Dr. Wilkie, licensing at this time is unnecessary because supply already far exceeds demand. Moreover, a near term auction would not recover the true value of the spectrum for the public, since an auction would likely either result in bids that do not defray auction expenses or in the issuance of licenses to speculators. As a final matter, increasing the supply of millimeter wave spectrum will also have negative effects on the ability of companies like FAN and others to secure capital, and impact their ability to see through the promise of the Commission's nascent secondary market policies.

A. Currently There Is A Substantial Surplus of Millimeter Wave Spectrum

There is, at present, a substantial surplus of millimeter wave spectrum. Although there are differentiating propagation and other characteristics of alternative bands, a significant amount of relatively fungible millimeter wave spectrum has been made

available for point-to-point or point-to-multipoint broadband applications, including 400 MHz at 24 GHz, 1,150 MHz at 28 GHz, and 1,400 MHz at 39 GHz.³ Now, the *Notice* proposes to allocate and license another 2,100 MHz of spectrum—increasing the bandwidth by over 70 percent for substantially similar services. Yet, to FAN’s knowledge, no party has actively sought the allocation and, as discussed below, there appears to be no demand for the allocation.

As the holder of the premier portfolio of 39 GHz spectrum, FAN is well-positioned to assess demand for broadband millimeter wave spectrum. One of the FAN leasing options allows carriers or other broadband customers to lease, for a period of one year, bandwidth for an OC-3 link virtually anywhere in the United States for \$500.00. As noted in Dr. Wilkie’s declaration, “[t]he rate of \$500 is less than 7% of the tariffed rate of a DS-1 link from an ILEC,” but “despite these prices and having an almost nationwide footprint, [FAN] has only sold only 25 leases.”⁴ FAN has also gone to considerable lengths to advertise its products—FAN maintains an extensive website, runs print advertisements in numerous industry journals, and the Chief Executive Officer of FAN, Dean Johnson, is a frequent author in trade journals and a frequent speaker at industry events.

FAN does believe that its leasing products will ultimately gain substantial industry acceptance. Prices for 39 GHz and 24 GHz radio equipment have dropped precipitously over the past 5 years. Demand for higher bandwidths—driven by 3G mobile deployment and increasing business data transmissions needs—is ever increasing,

³ Additional, slightly lower bandwidth licenses are also available at 6 GHz, 11 GHz, and 18 GHz.

⁴ *Dr. Wilkie Declaration* at 4-5.

and fiber optic deployment will not be able to ubiquitously serve even dense business districts. FAN believes that radio-based broadband thus has an important role in the future of broadband—leased millimeter wave spectrum is economical, flexible, scaleable, and reliable. Yet, even FAN would concede—based on Dr. Wilkie’s observation that “virtually 100% of [FAN’s] capacity of 1 billion channel-pops currently lies dormant”⁵—that this niche market is not yet robustly developed. In all fairness, however, the concept of spectrum leasing is novel and industry participants have not had significant experience with leasing—both of these factors are prerequisites to the proverbial “hockey stick” demand curve.

B. The Licensing of Additional Millimeter Wave Spectrum At This Time Is Not In The Public Interest

FAN does not believe that the licensing of additional millimeter wave spectrum at this time would serve the public interest. As an initial matter, as observed by Dr. Wilkie in his declaration, an auction today would likely have one of two outcomes: (i) the auction would net less than the costs of holding the auction, as was the case in the recent 24 GHz auction, or (ii) the prices paid at auction would not fully compensate the public for the use of the spectrum. Neither of these results would be in the public interest. Instead, the Commission should, in view of the substantial extant surplus of millimeter wave spectrum on the market, defer licensing of the 37/42 GHz bands until demand develops further.

Examining the results of the recent 24 GHz auction is instructive in a number of ways. First, the auction attracted only three bidders and netted only seven bids—at the minimum bid level—on seven licenses, with a total dollar value, after designated entity

⁵ *Dr. Wilkie Declaration* at 5.

bidding credits, of only \$216,500.00.⁶ Of the three bidders, only FAN was a recognized industry player. The other two applicants shared strategic intelligence and appear, based on their applications, to be speculators. To reinforce Dr. Wilkie's point that speculators in auctions can distort results by bidding with incomplete information, half of the bids placed by these entities were for authorizations where substantial encumbrances existed. Notwithstanding that Teligent holds only one license—Channel 37—in the Buffalo, NY SMSA, a bidder elected to bid on that channel instead of bidding on one of the four other channels where no encumbrances existed, despite that the minimum bid for each channel was the same. Similarly, in Las Vegas, NV and Phoenix, AZ, the bidders elected to bid on channels where Teligent held the core SMSA areas instead of bidding on the clear channels that existed in those markets, thus paying substantially more per effective POP *even though there were no competing bidders in that market.*

In his declaration, Dr. Wilkie also makes fundamental points regarding why an auction of 37/42 GHz spectrum is not in the public interest at this time. First, he notes that based on the variability of pricing in millimeter wave spectrum in the past five years, derived by comparing the results of the 2004 24 GHz auction and the 2000 39 GHz auction, that selling the 37/42 GHz spectrum now may “giv[e] up an option worth over \$41 million in return for revenue today of perhaps a few hundred thousand dollars.”⁷ As Dr. Wilkie concludes, “[t]his hardly amounts to the public retaining a fair portion of the value of the spectrum.”⁸ Dr. Wilkie does note that one potential remedial measure to

⁶ See “24 GHz Service Spectrum Auction Closes; Winning Bidders Announced,” *FCC Public Notice*, DA 04-2429 (Rel. Aug. 2, 2004) at Att. A.

⁷ *Dr. Wilkie Declaration* at 7-8.

⁸ *Id.*

avoid this result would be to establish a more realistic reserve price for the licenses, but observes that “if reserve prices are set reflecting the option value, then we face the real possibility that, because of the current excess supply, the vast majority of license will not be sold.”⁹ Indeed, given the fungibility of the spectrum, Dr. Wilkie warns that, “as in the 24 GHz auction, the administrative costs of the auction may exceed the auction revenues.”¹⁰ On balance, however, should the FCC inadvisably move ahead with an auction of 37/42 GHz spectrum, FAN believes that reserve prices should reflect the actual option price of the spectrum.

Dr. Wilkie also argues that an auction of millimeter wave spectrum at this time may also give rise to competitive issues. In particular, due to the current value disparity that may be caused by auctioning spectrum at a time where supply exceeds demand, non-radio competitors to millimeter wave applications may find it economic to enter the auction for the sole purpose of forestalling radio-based competition. Specifically, as stated by Dr. Wilkie, “if current auction prices are low due to excess supply, the incumbent LEC has the incentive and ability to purchase the licenses at low cost and thereby legally thwart competition from a future entrant.”¹¹ Indeed, for the same reasons as the FCC has imposed incumbent LEC eligibility restrictions in other broadband auctions, Dr. Wilkie recommends, and FAN supports, the imposition of such restrictions for 37/42 GHz.

⁹ *Id.* at 8.

¹⁰ *Id.*

¹¹ *Id.* at 10.

As a final matter, Dr. Wilkie also makes the related point that, by holding an auction at a time when supply exceeds demand, the FCC may hurt those firms that have already invested in a technology. Specifically, Dr. Wilkie states that “adding more supply in a market with excess supply hampers the firms’ access to capital and so may lead to a slower deployment of new technology.”¹² From FAN’s perspective, this results in the FCC effectively undermining the economic basis for the firms that the agency has encouraged to develop secondary markets as an initiative before those entities have realistically been able to achieve substantial customer acceptance.

III. CONCLUSION

FAN is one of the industry’s greatest advocates for the benefits of millimeter wave spectrum. FAN believes that broadband spectrum will serve a critical niche market that will bridge between telco plant and costly fiber and knit together the future 3G networks of mobile carriers. Yet, even FAN recognizes that, at this juncture, the supply of millimeter wave spectrum far outstrips demand for broadband point-to-point or point-to-multipoint radio services. FAN is one of a few companies that is using the FCC’s Secondary Markets policies to lay the foundation for optimal and efficient use of this spectrum in the near term. Flooding the market with additional spectrum at this time, however, will impose great hardships on such companies in this nascent industry. Moreover, auctioning substantial spectrum reserves at a time where supply exceeds demand will not serve the public interest in any event—either the auction will net prices below “real value,” thus depriving the public of the value of the spectrum, or the auction will result in substantial retained spectrum and revenues that do not justify the process, as

¹² *Id.* at 8.

DECLARATION OF SIMON WILKIE

I. INTRODUCTION

1. My name is Simon J. Wilkie. I am a Senior Research Associate at the California Institute of Technology. I am also an academic affiliate of ERS Group, an economic and financial consulting firm. Prior to joining the faculty at the California Institute of Technology, I was a Member of Technical Staff at Bell Communications Research, a scholar of the Milken Institute, and a visiting professor at Columbia University. Over the past fifteen years, my academic research has focused on the areas of industrial organization, regulation, and game theory or business strategy, with a particular emphasis on the telecommunications industry. From 2002 to 2003 I served as Chief Economist at the Federal Communications Commission (“FCC” or “Commission”). I received a Bachelor of Commerce degree in Economics from the University of South Wales, and an M.A. and Ph.D. in Economics from the University of Rochester.

2. I have been retained by First Avenue Networks to comment on the economic issues surrounding the proposal to auction additional spectrum in the 37/42 GHz band to create a greater supply of spectrum for 39 GHz type services. In particular, I address the issue of the timing of the proposed auction and examine whether the public interest is served by conducting such an auction in the near future.

3. I find that the current market for 39 GHz services is characterized by chronic excess supply. Moreover, there is no indication that this market condition will change in the near future. Thus, the public interest benefits from further increasing the supply of such services at this time are non-existent. However, given the goals of spectrum auctions established by Congress, there are three significant public interest harms. First, by auctioning this spectrum

now, the Commission will forego its option to auction the spectrum for a potentially higher value at a later date. This opportunity cost is likely to be significant, as indicated by the discrepancy in revenues between the 39 GHz auction (held in 2000) and the recent 24 GHz auction (held in 2004).¹ As a consequence, the U.S. Treasury will lose its share of the potential increase in the value of the asset that would occur if the auction were deferred to a later date. Second, in a market characterized by chronic excess supply, current operators face challenges raising the necessary capital to provide services. By creating additional excess supply, the proposed auction will exacerbate this problem and create the possibility that the provision of such services will be delayed. Third, given current market conditions, the most likely outcome of the auction is that many licenses will fail to meet the reserve bid and/or the winners will “warehouse” the spectrum. This may lead to an inefficient allocation as the winning bidders attempt to extract any rents from future entrants should market conditions change.

4. Therefore, in my opinion, the public interest is best served if the Commission delays the proposed auction until market conditions indicate that there is no longer an excess supply of capacity at these frequencies. This is in sharp contrast to spectrum below 3 GHz, where the market has indicated an excess demand and delays in deployment impose significant social costs. Thus, the Commission should focus its attention on auctioning spectrum in those areas characterized by excess demand, not those areas characterized by excess supply.

¹ The 39 GHz auction, held in April and May of 2000, sold 2,173 licenses for total net bids (i.e., total revenues less withdrawal payments) of approximately \$410.6 million. By contrast, the July 2004 24 GHz auction sold 7 licenses for net bids of \$216,050. *See* Federal Communications Commission, “Auction 56: 24 GHz Service,” http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=56 (Aug. 3, 2004); Federal Communications Commission, “Auction 30: 39GHz,” http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=30 (Aug. 1, 2003).

II. DESCRIPTION OF THE PRODUCT MARKET

5. As the cost of high-frequency components has fallen, millimeter wave bands have become attractive for the transmission of broadband data and voice services. These transmission frequencies include the 24 GHz, 26 GHz, 28 GHz, 31 GHz, 38 GHz, and 39 GHz bands. Millimeter bands offer higher capacity than traditional, lower frequency bands as well as high gain/directivity antennas. Although they are line-of-sight systems, and thus are limited by line-of-sight considerations, they offer better frequency utilization efficiency due to the superior frequency reuse schemes rendered by high gain antennas. Although different bands may have different advantages over certain distances and in certain weather conditions, given the similarities of the services and their use in business plans, I will consider all these services as reasonable substitutes that comprise a relevant economic market, namely: “millimeter wave band point-to-point fixed wireless transport.”

6. The FCC has auctioned off large numbers of licenses to use millimeter band spectrum in several auctions. The major winners of licenses include Advanced Radio Telecom, Inc. (ART), Winstar Communications, Teligent Inc., and XO Communications. Initially, each of these firms had a business plan based on deploying a wireless carrier network. For various reasons, each of these companies failed in its initial business plan and subsequently entered into bankruptcy. Thus, since these firms could not support pricing that would recoup their costs or fill their capacity, there was clear evidence that the market was not characterized by excess demand or a lack of competition, but rather by chronic excess supply. In addition, these new firms faced competition from other fixed wireless providers, such as Sprint, AT&T, and MCI, that used lower frequency bandwidth services. It is notable that these firms have also largely retreated from the market.

7. In May 2003, the FCC issued its important and groundbreaking Secondary Markets Order.² This Order introduced the possibility that the holder of spectrum licenses could lease access using the spectrum on contractual terms and conditions. This created the opportunity for a new type of business plan (i.e., a spectrum leasing model), as holders of licenses were no longer tied to the carrier model. The spectrum leasing rules were further streamlined in July 2004.³ Subsequent to the FCC's Order, ART has emerged from bankruptcy as First Avenue Networks and embraced the spectrum leasing model. The spectrum assets of Winstar have been acquired by IDT Telecom, who has also adopted the spectrum-leasing model.⁴ Furthermore, XO Communications, upon emerging from its bankruptcy, is leasing spectrum in some markets.⁵ Thus, the spectrum leasing model truly is a nascent market – barely a year old – yet holds promise as a way to implement the efficient utilization of these bandwidths. However, this market is in its infancy, and it is too early to tell if this business model will be successful given current excess capacity.

8. I have been informed by First Avenue Networks that they currently offer a point to point product, “Express Link” with OC-3 level capacity, that is leased for \$500 a year per link. Although a purchaser would also have to bear the additional costs of leasing the required electronic equipment, such as an antenna and radios, this rate is astounding. The rate of \$500 is

² See Federal Communications Commission, *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 00-230, 18 F.C.C. Rcd 20604 (Oct. 6, 2003) (adopted May 15, 2003).

³ See Federal Communications Commission, *Second Report and Order, Order on Reconsiderations, and Further Notice of Proposed Rulemaking*, WT Docket No. 00-230, 19 F.C.C. Rcd 17503 (Sept. 2, 2004) (adopted July 8, 2004).

⁴ See IDT Press Release, dated June 16 2003 at <http://www.idtsolutions.net/products/spectrum/pr-6-16-03.asp>

⁵ See *Broadband Wireless Business Magazine* (dated July 8 2004), at <http://www.shorecliffcommunications.com/magazine/news.asp?news=3558>.

less than 7 percent of the tariffed rate of a DS-1 link from an incumbent local exchange carrier (“ILEC”) and about one thirty-sixth of the cost of DS-3 link.⁶ However, despite these prices and having an almost nationwide footprint, First Avenue Networks has only sold twenty-five leases. That is, virtually 100 percent of their capacity of almost 1 billion channel-pops currently lies dormant. This is a clear indication of excess supply.⁷ Moreover, given this excess supply and the paucity of revenues, it is improbable that competition from a new entrant will result in lower prices or any uptake in demand. This is in stark contrast to the case of commercial mobile radio service (“CMRS”), where there is clearly demand for more spectrum and consequently significant consumer benefits from increasing supply.

9. Further insight into the state of the market can be garnered from examining past auction prices. In this case, it is instructive to compare the outcomes of the failed 24 GHz auction, Auction No. 56, and the 39 GHz auction, Auction No. 30. Auction No. 30 closed in May 2000 and raised \$410,649,085 in net revenue.⁸ The prices are indicative of the market expectations at that time. In contrast, in the recent Auction No. 56, which closed in August 2004, only 7 of 880 licenses were sold, and revenues amounted to \$216,050, or about 0.05 percent of the revenues from Auction No. 30.⁹ Thus, once again, the market is telling us that currently there is chronic excess supply and that the marginal spectrum has almost no social or economic value. Indeed, it is highly probable that the administrative costs of running such an

⁶ See, e.g., *Declaration of Michael Williams*, prepared on behalf of T-Mobile in FCC WC Docket No. 04-313.

⁷ It is instructive to compare the revenues of \$12,500 a month with the cost of acquiring the spectrum in Auction No. 30 of approximately \$410 million.

⁸ See Federal Communications Commission, “Auction 56: 24 GHz Service,” http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=56 (Aug. 3, 2004).

⁹ See Federal Communications Commission, “Auction 30: 39GHz,” http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=30 (Aug. 1, 2003).

auction will be greater than the revenues raised. The FCC's scarce resources would be better spent auctioning spectrum that has excess demand and will likely raise significant revenues.

III. ECONOMIC ANALYSIS OF PUBLIC INTEREST BENEFITS AND HARMS

10. Given the current state of the market, the analysis of the public interest benefits from holding the proposed auction is straightforward. To calculate the benefits, one would follow the same methodology adopted previously by Hazlet and Munoz and myself.¹⁰ Such an analysis would involve calculating the additional consumer surplus and producer surplus created from the additional supply.¹¹ However, in a market with excess supply the analysis is trivial; with chronic excess supply, market price should be forced down to marginal cost, implying that competition cannot lower prices further. Thus, there would be no increase in consumer surplus (i.e., demand would not be expanded by lower prices). Moreover, with chronic excess capacity, any potential entrant could currently purchase the idle excess capacity of one of the incumbent firms. Thus, the auction is not required to increase supply and, therefore, there would be no increase in producer surplus attributable to the auction. Thus, from an economic perspective, there is literally no benefit from holding the auction today rather than deferring the auction to a later date. Again, this is in stark contrast to the case of CMRS and other spectrum below 3 GHz,

¹⁰ See Thomas Hazlett and Robert Munoz (2004) "What Really Happens in Spectrum Allocation Design" *AEI-Brookings Joint Center Working Paper 04-16*. See also, *Declaration of Simon Wilkie*, prepared on behalf of T-Mobile, In the Matter of Broadband PCS Spectrum Auction 58, FCC DA 04-1639 (dated July 30, 2004).

¹¹ Consumer surplus is the amount of excess of the total consumer valuation of the services purchased over the amount that they paid to producers for those services. Producer surplus is the excess of total producer revenues over and above the economic cost of the resources used to provide those services. See for example, John Taylor (2004) *PRINCIPLES OF ECONOMICS*, 4th Edition, Houghton-Mifflin, Boston MA.

where there is currently excess demand and where making additional spectrum available leads to significant social benefits.

11. We now turn to the issue of social costs of holding the proposed auction under the current market conditions. The fundamental notion of cost in economics is “opportunity cost,” which is the value of the best option forgone. In the case at hand, the opportunity cost of holding the proposed auction today is that the licenses sold today cannot be auctioned in the future. Given that Congress instructed the FCC that one of the goals of the auction process was the recovery of a proportion of the value of the public spectrum for the public, this opportunity cost must be considered.

12. In recent years, there has been a significant development in the economics of how to quantify such costs. This technique is known as “Real Options.”¹² The starting point in such an analysis is to quantify the distribution of possible revenues. Using the mean and variance of the distribution, one can estimate a “strike price.” An asset should be sold when likely revenues exceed the strike price. In this case, it is instructive to compare the revenues from Auction Nos. 30 and 56 described above. The distribution has enormous variance (as revenues vary by a factor of 2,000), implying the option value dwarfs the revenues attained in Auction No. 56.

13. To size the option value, consider that at the time of Auction No. 30 the prices reflected the value of the licenses based on projections about the state of demand and technology at that time. Despite the improvements in fixed wireless technology, these projections have not yet been realized. However, suppose that there is only a 10 percent chance of these projections being realized through improvements in technology in the next five years. Then the expected

¹² See Avanish Dixit, and Robert Pindyck (1994), *INVESTMENT UNDER UNCERTAINTY*, Princeton University Press, Princeton NJ, or Lenos Trigeorgis (1996), *REAL OPTIONS: MANAGEMENT FLEXIBILITY AND STRATEGY IN RESOURCE ALLOCATION*, MIT Press, Cambridge, Mass.

value of the licenses is approximately 10 percent of \$410 million plus 90 percent of \$200,000, or \$41.18 million. Thus, based on the most recent price data, Auction No. 59, by auctioning the spectrum today, the FCC is giving up an option worth over \$41 million in return for revenue today of perhaps a few hundred thousand dollars. This hardly amounts to the public retaining a fair portion of the value of the spectrum.

14. To combat this problem, one solution is to impose reserve prices. The FCC has been directed to use reserve prices after the failure of Auction No. 14 (Wireless Communication Service, or “WCS”), to raise significant revenues. Indeed, Auction No. 14 was another case in which spectrum was sold prematurely. However, if reserve prices are set reflecting the option value, then we face the real possibility that, because of the current excess supply, the vast majority of licenses will not be sold. Then, as in the 24 GHz auction, the administrative costs of the auction may exceed the auction revenues.

15. The second public interest harm is that adding more supply in a market with excess supply hampers the firms’ access to capital and so may lead to a slower deployment of new technology. This is contrary to the goals that Congress established. Again, this is a market with excess supply; therefore, no economic rents are being earned. The capital market, in order to lend funds for new investments in technology or infrastructure, requires that there is a credible model showing that the investor can earn an expected rate of return commensurate with the risk involved.¹³ A primary factor considered by the capital market when assessing an investment is the entry conditions in the market. If there is the scope for low cost entry in a market, then the initial investment is at risk. The capital market is unlikely to invest or will demand a higher short-run return from the firm, thus imposing a higher cost of capital. In the current market with

¹³ Richard Brealey and Stewart Myers, *PRINCIPLES OF CORPORATE FINANCE*, 6th edition.

excess supply, there are no short-term rents being earned by the firms in the market. By adding more potential supply to market, the FCC will have added to both the supply overhang and the ease of entry, should the excess supply problem be solved. Therefore, it would have raised the cost of capital of the incumbent firms or foreclosed access to some sources of capital. Thus, there may well be less investment. This is a critical issue for companies holding spectrum licenses near the proposed auction spectrum in that many of these companies have emerged from bankruptcy and still require investment capital to operate. This problem (i.e., in the presence of sunk costs a period of rents is required to induce capital into the market) is widely known. Indeed, it is the foundation for the existence of patents and copyright.¹⁴

16. Finally, there is another potential problem with holding an auction in a state of excess supply: It may induce an inter-temporal inefficiency. If the secondary markets are efficient, then ultimately the most efficient user of the spectrum will purchase the licenses in the secondary resale market. Unfortunately, the history of spectrum policy has shown us that this is not the case. Indeed, it would be woefully naïve to suppose that such an outcome will occur. In particular, if the auction does not initially assign the licenses to the ultimate highest value users, then economic theory tells us that there are two causes of inefficiency in secondary markets: the “holdup” problem and the “withholding” problem.

17. The holdup problem is well known in economics and to those who have followed the history of spectrum allocation. To illustrate, suppose that the license is sold today. As there is no viable business plan at the moment, it will likely be purchased by speculators with the plan of reselling the license at a later date for a profit. However, in the future when conditions are such that the spectrum can support a viable business plan, then the speculator has control of an

¹⁴ See Jean Tirole (1993), *THE THEORY OF INDUSTRIAL ORGANIZATION*, MIT Press, Chapter 10.

essential input and will try to extract the possible rents from the entrant in the sale price. If the speculator has imperfect information about the size of these rents, then this will lead to some inefficiency. This is because there will be delay or “holdup” in the bargaining process, and sometimes the license will not be sold as the seller wants to maximize his expected return. Indeed, economics tell us thus this must happen.¹⁵ In contrast, if the spectrum was not sold currently but retained by the FCC and auctioned when there is a viable market, then because the FCC’s goals are efficiency and not profit maximization, then a properly designed auction should reach the efficient allocation. Thus, a premature allocation can undercut long-run efficiency. The problems that national CMRS carriers have faced in the aggregation of spectrum in secondary markets and the problems faced by the FCC every time it tries re-banding are evidence of the scope of this problem.

18. The withholding problem arises because of the possibility that wireless technology will ultimately provide competition to wireline products. Thus, if the auction is held prematurely, and is an open auction, it is likely that some winners will be the incumbent local exchange carriers. The ILECs do not have the incentive to deploy products that compete with their own wireline offerings. Therefore, in the future if technology develops such that there is new efficient entrant, the ILEC will not sell the licenses to the entrant unless it can pay a price that will exceed the rents that the ILEC will lose from competition. Thus, if current auction prices are low due to excess supply, the incumbent LEC has the incentive and ability to purchase the licenses at low cost and thereby legally thwart competition from a future entrant. Indeed, the FCC has previously recognized the scope of the problem by imposing eligibility restrictions on

¹⁵ See, e.g., Roger Myerson and Mark Satterwaite (1983), “Efficient Mechanisms for Bilateral Trading,” *Journal of Economic Theory*, 28: 265-28.

incumbents in certain other auctions. If the auction were to proceed, then under the current market conditions, I would recommend such eligibility restrictions here.

IV. CONCLUSION

19. The conditions of the current market for 39 GHz and similar services are characterized by chronic excess supply. Thus, there is no consumer benefit from adding additional supply. In contrast, holding an auction in a market characterized by excess supply has the potential to create several public interest harms. In particular, the FCC will forgo possible additional revenues that could be obtained if the auction were held a future date; existing firms' access to capital may be hampered, thus delaying the deployment of technology and new service offerings; and the efficiency of the auction process may be compromised. Efficiency in the auction may be compromised because, with the lack of viable current business plans for an entrant, it is likely that the auction winners will be speculators or firms with the incentive to withhold the spectrum from future applications. These issues are especially problematic because the development of the spectrum leasing business model is in its infancy. It would be folly to undercut the goals of the Secondary Markets Orders and past work of this Commission by dumping yet more supply on the market before these nascent markets have found a way to equilibrate and clear the existing excess supply. Therefore, in my opinion, it would be prudent for the FCC to delay the auction of the 37/42 GHz bands until the marketplace has resolved the chronic excess supply. Indeed, economics tells us that the FCC should concentrate its attention on increasing the availability of spectrum in those bands where there is chronic *excess demand*, rather than chronic excess supply.